

## SEQUENCE LISTING

&lt;110&gt; EXELIXIS, INC.

<120> MAPKs AS MODIFIERS OF THE RAC, AXIN, AND BETA-CATENIN PATHWAYS  
AND METHODS OF USE

&lt;130&gt; EX03-089C-PC

&lt;150&gt; US 60/429,061

&lt;151&gt; 2002-11-25

&lt;150&gt; US 60/437,163

&lt;151&gt; 2002-12-30

&lt;160&gt; 40

&lt;170&gt; PatentIn version 3.2

&lt;210&gt; 1

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<213> Homo sapiens

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<400> 36

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Asn Gly Thr Tyr Gly Gln Val Tyr Lys Gly Arg His Val Lys Thr Gly  
35 40 45

Gln Leu Ala Ala Ile Lys Val Met Asp Val Thr Gly Asp Glu Glu Glu  
50 55 60

Glu Ile Lys Gln Glu Ile Asn Met Leu Lys Lys Tyr Ser His His Arg  
65 70 75 80

Asn Ile Ala Thr Tyr Tyr Gly Ala Phe Ile Lys Lys Asn Pro Pro Gly  
85 90 95

Met Asp Asp Gln Leu Trp Leu Val Met Glu Phe Cys Gly Ala Gly Ser  
100 105 110

Val Thr Asp Leu Ile Lys Asn Thr Lys Gly Asn Thr Leu Lys Glu Glu  
115 120 125

Trp Ile Ala Tyr Ile Cys Arg Glu Ile Leu Arg Gly Leu Ser His Leu  
130 135 140

His Gln His Lys Val Ile His Arg Asp Ile Lys Gly Gln Asn Val Leu  
145 150 155 160

Leu Thr Glu Asn Ala Glu Val Lys Leu Val Asp Phe Gly Val Ser Ala  
165 170 175

Gln Leu Asp Arg Thr Val Gly Arg Arg Asn Thr Phe Ile Gly Thr Pro  
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Tyr Trp Met Ala Pro Glu Val Ile Ala Cys Asp Glu Asn Pro Asp Ala  
195 200 205

Thr Tyr Asp Phe Lys Ser Asp Leu Trp Ser Leu Gly Ile Thr Ala Ile  
210 215 220

Glu Met Ala Glu Gly Ala Pro Pro Leu Cys Asp Met His Pro Met Arg  
225 230 235 240

Ala Leu Phe Leu Ile Pro Arg Asn Pro Ala Pro Arg Leu Lys Ser Lys  
245 250 255

Lys Trp Ser Lys Lys Phe Gln Ser Phe Ile Glu Ser Cys Leu Val Lys  
260 265 270

Asn His Ser Gln Arg Pro Ala Thr Glu Gln Leu Met Lys His Pro Phe  
 275 280 285

Ile Arg Asp Gln Pro Asn Glu Arg Gln Val Arg Ile Gln Leu Lys Asp  
 290 295 300

His Ile Asp Arg Thr Lys Lys Lys Arg Gly Glu Lys Asp Glu Thr Glu  
 305 310 315 320

Tyr Glu Tyr Ser Gly Ser Glu Glu Glu Glu Glu Asn Asp Ser Gly  
 325 330 335

Glu Pro Ser Ser Ile Leu Asn Leu Pro Gly Glu Ser Thr Leu Arg Arg  
 340 345 350

Asp Phe Leu Arg Leu Gln Leu Ala Asn Lys Glu Arg Ser Glu Ala Leu  
 355 360 365

Arg Arg Gln Gln Leu Glu Gln Gln Arg Glu Asn Glu Glu His Lys  
 370 375 380

Arg Gln Leu Leu Ala Glu Arg Gln Lys Arg Ile Glu Glu Gln Lys Glu  
 385 390 395 400

Gln Arg Arg Arg Leu Glu Glu Gln Gln Arg Arg Glu Lys Glu Leu Arg  
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Lys Gln Gln Glu Arg Glu Gln Arg Arg His Tyr Glu Glu Gln Met Arg  
 420 425 430

Arg Glu Glu Glu Arg Arg Arg Ala Glu His Glu Gln Glu Tyr Lys Arg  
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Lys Gln Leu Glu Glu Gln Arg Gln Ala Glu Arg Leu Gln Arg Gln Leu  
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Lys Gln Glu Arg Asp Tyr Leu Val Ser Leu Gln His Gln Arg Gln Glu  
 465 470 475 480

Gln Arg Pro Val Glu Lys Lys Pro Leu Tyr His Tyr Lys Glu Gly Met  
 485 490 495

Ser Pro Ser Glu Lys Pro Ala Trp Ala Lys Glu Val Glu Glu Arg Ser  
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Arg Leu Asn Arg Gln Ser Ser Pro Ala Met Pro His Lys Val Ala Asn  
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Arg Ile Ser Asp Pro Asn Leu Pro Pro Arg Ser Glu Ser Phe Ser Ile  
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Ser Gly Val Gln Pro Ala Arg Thr Pro Pro Met Leu Arg Pro Val Asp  
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Pro Gln Ile Pro His Leu Val Ala Val Lys Ser Gln Gly Pro Ala Leu  
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Thr Ala Ser Gln Ser Val His Glu Gln Pro Thr Lys Gly Leu Ser Gly  
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Phe Gln Glu Ala Leu Asn Val Thr Ser His Arg Val Glu Met Pro Arg  
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Gln Asn Ser Asp Pro Thr Ser Glu Asn Pro Pro Leu Pro Thr Arg Ile  
 610 615 620

Glu Lys Phe Asp Arg Ser Ser Trp Leu Arg Gln Glu Glu Asp Ile Pro  
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Pro Lys Val Pro Gln Arg Thr Thr Ser Ile Ser Pro Ala Leu Ala Arg  
 645 650 655

Lys Asn Ser Pro Gly Asn Gly Ser Ala Leu Gly Pro Arg Leu Gly Ser  
 660 665 670

Gln Pro Ile Arg Ala Ser Asn Pro Asp Leu Arg Arg Thr Glu Pro Ile  
 675 680 685

Leu Glu Ser Pro Leu Gln Arg Thr Ser Ser Gly Ser Ser Ser Ser Ser  
 690 695 700

Ser Thr Pro Ser Ser Gln Pro Ser Ser Gln Gly Gly Ser Gln Pro Gly  
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Ser Gln Ala Gly Ser Ser Glu Arg Thr Arg Val Arg Ala Asn Ser Lys  
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Ser Glu Gly Ser Pro Val Leu Pro His Glu Pro Ala Lys Val Lys Pro  
 740 745 750

Glu Glu Ser Arg Asp Ile Thr Arg Pro Ser Arg Pro Ala Ser Tyr Lys  
 755 760 765



Lys Ala Ile Asp Glu Asp Leu Thr Ala Leu Ala Lys Glu Leu Arg Glu  
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Leu Arg Ile Glu Glu Thr Asn Arg Pro Met Lys Lys Val Thr Asp Tyr  
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Ser Ser Ser Ser Glu Glu Ser Glu Ser Ser Glu Glu Glu Glu Glu Asp  
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Gly Glu Ser Glu Thr His Asp Gly Thr Val Ala Val Ser Asp Ile Pro  
 820 825 830

Arg Leu Ile Pro Thr Gly Ala Pro Gly Ser Asn Glu Gln Tyr Asn Val  
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Gly Met Val Gly Thr His Gly Leu Glu Thr Ser His Ala Asp Ser Phe  
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Ser Gly Ser Ile Ser Arg Glu Gly Thr Leu Met Ile Arg Glu Thr Ser  
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Gly Glu Lys Lys Arg Ser Gly His Ser Asp Ser Asn Gly Phe Ala Gly  
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His Ile Asn Leu Pro Asp Leu Val Gln Gln Ser His Ser Pro Ala Gly  
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Thr Pro Thr Glu Gly Leu Gly Arg Val Ser Thr His Ser Gln Glu Met  
 915 920 925

Asp Ser Gly Thr Glu Tyr Gly Met Gly Ser Ser Thr Lys Ala Ser Phe  
 930 935 940

Thr Pro Phe Val Asp Pro Arg Val Tyr Gln Thr Ser Pro Thr Asp Glu  
 945 950 955 960

Asp Glu Glu Asp Glu Glu Ser Ser Ala Ala Ala Leu Phe Thr Ser Glu  
 965 970 975

Leu Leu Arg Gln Glu Gln Ala Lys Leu Asn Glu Ala Arg Lys Ile Ser  
 980 985 990

Val Val Asn Val Asn Pro Thr Asn Ile Arg Pro His Ser Asp Thr Pro  
 995 1000 1005

Glu Ile Arg Lys Tyr Lys Lys	Arg Phe Asn Ser Glu Ile Leu Cys
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Ala Ala Leu Trp Gly Val Asn	Leu Leu Val Gly Thr Glu Asn Gly
1025	1030 1035
Leu Met Leu Leu Asp Arg Ser	Gly Gln Gly Lys Val Tyr Asn Leu
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Ile Asn Arg Arg Arg Phe Gln	Gln Met Asp Val Leu Glu Gly Leu
1055	1060 1065
Asn Val Leu Val Thr Ile Ser	Gly Lys Lys Asn Lys Leu Arg Val
1070	1075 1080
Tyr Tyr Leu Ser Trp Leu Arg	Asn Arg Ile Leu His Asn Asp Pro
1085	1090 1095
Glu Val Glu Lys Lys Gln Gly	Trp Ile Thr Val Gly Asp Leu Glu
1100	1105 1110
Gly Cys Ile His Tyr Lys Val	Val Lys Tyr Glu Arg Ile Lys Phe
1115	1120 1125
Leu Val Ile Ala Leu Lys Asn	Ala Val Glu Ile Tyr Ala Trp Ala
1130	1135 1140
Pro Lys Pro Tyr His Lys Phe	Met Ala Phe Lys Ser Phe Ala Asp
1145	1150 1155
Leu Gln His Lys Pro Leu Leu	Val Asp Leu Thr Val Glu Glu Gly
1160	1165 1170
Gln Arg Leu Lys Val Ile Phe	Gly Ser His Thr Gly Phe His Val
1175	1180 1185
Ile Asp Val Asp Ser Gly Asn	Ser Tyr Asp Ile Tyr Ile Pro Ser
1190	1195 1200
His Ile Gln Gly Asn Ile Thr	Pro His Ala Ile Val Ile Leu Pro
1205	1210 1215
Lys Thr Asp Gly Met Glu Met	Leu Val Cys Tyr Glu Asp Glu Gly
1220	1225 1230
Val Tyr Val Asn Thr Tyr Gly	Arg Ile Thr Lys Asp Val Val Leu
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Gln Trp Gly Glu Met Pro Thr Ser Val Ala Tyr Ile His Ser Asn  
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Gln Ile Met Gly Trp Gly Glu Lys Ala Ile Glu Ile Arg Ser Val  
1265 1270 1275

Glu Thr Gly His Leu Asp Gly Val Phe Met His Lys Arg Ala Gln  
1280 1285 1290

Arg Leu Lys Phe Leu Cys Glu Arg Asn Asp Lys Val Phe Phe Ala  
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Asn Arg Asn Ser Met Met Asn Trp  
1325 1330

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Ser Leu Arg Asp Pro Ala Gly Ile Phe Glu Leu Val Glu Val Val Gly  
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Asn Gly Thr Tyr Gly Gln Val Tyr Lys Gly Arg His Val Lys Thr Gly  
35 40 45

Gln Leu Ala Ala Ile Lys Val Met Asp Val Thr Glu Asp Glu Glu Glu  
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Glu Ile Lys Leu Glu Ile Asn Met Leu Lys Lys Tyr Ser His His Arg  
65 70 75 80

Asn Ile Ala Thr Tyr Tyr Gly Ala Phe Ile Lys Lys Ser Pro Pro Gly  
85 90 95

His Asp Asp Gln Leu Trp Leu Val Met Glu Phe Cys Gly Ala Gly Ser  
100 105 110

Ile Thr Asp Leu Val Lys Asn Thr Lys Gly Asn Thr Leu Lys Glu Asp

115	120	125
Trp Ile Ala Tyr Ile Ser Arg Glu Ile Leu Arg Gly Leu Ala His Leu 130 135 140		
His Ile His His Val Ile His Arg Asp Ile Lys Gly Gln Asn Val Leu 145 150 155 160		
Leu Thr Glu Asn Ala Glu Val Lys Leu Val Asp Phe Gly Val Ser Ala 165 170 175		
Gln Leu Asp Arg Thr Val Gly Arg Arg Asn Thr Phe Ile Gly Thr Pro 180 185 190		
Tyr Trp Met Ala Pro Glu Val Ile Ala Cys Asp Glu Asn Pro Asp Ala 195 200 205		
Thr Tyr Asp Tyr Arg Ser Asp Leu Trp Ser Cys Gly Ile Thr Ala Ile 210 215 220		
Glu Met Ala Glu Gly Ala Pro Pro Leu Cys Asp Met His Pro Met Arg 225 230 235 240		
Ala Leu Phe Leu Ile Pro Arg Asn Pro Pro Pro Arg Leu Lys Ser Lys 245 250 255		
Lys Trp Ser Lys Lys Phe Phe Ser Phe Ile Glu Gly Cys Leu Val Lys 260 265 270		
Asn Tyr Met Gln Arg Pro Ser Thr Glu Gln Leu Leu Lys His Pro Phe 275 280 285		
Ile Arg Asp Gln Pro Asn Glu Arg Gln Val Arg Ile Gln Leu Lys Asp 290 295 300		
His Ile Asp Arg Thr Arg Lys Lys Arg Gly Glu Lys Asp Glu Thr Glu 305 310 315 320		
Tyr Glu Tyr Ser Gly Ser Glu Glu Glu Glu Glu Val Pro Glu Gln 325 330 335		
Glu Gly Glu Pro Ser Ser Ile Val Asn Val Pro Gly Glu Ser Thr Leu 340 345 350		
Arg Arg Asp Phe Leu Arg Leu Gln Gln Glu Asn Lys Glu Arg Ser Glu 355 360 365		

Ala Leu Arg Arg Gln Gln Leu Leu Gln Glu Gln Gln Leu Arg Glu Gln  
 370 375 380

Glu Glu Tyr Lys Arg Gln Leu Leu Ala Glu Arg Gln Lys Arg Ile Glu  
 385 390 395 400

Gln Gln Lys Glu Gln Arg Arg Arg Leu Glu Glu Gln Gln Arg Arg Glu  
 405 410 415

Arg Glu Ala Arg Arg Gln Gln Glu Arg Glu Gln Arg Arg Arg Glu Gln  
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Glu Glu Lys Arg Arg Leu Glu Glu Leu Glu Arg Arg Arg Lys Glu Glu  
 435 440 445

Glu Glu Arg Arg Arg Ala Glu Glu Glu Lys Arg Arg Val Glu Arg Glu  
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Gln Glu Tyr Ile Arg Arg Gln Leu Glu Glu Glu Gln Arg His Leu Glu  
 465 470 475 480

Val Leu Gln Gln Gln Leu Leu Gln Glu Gln Ala Met Leu Leu His Asp  
 485 490 495

His Arg Arg Pro His Pro Gln His Ser Gln Gln Pro Pro Pro Pro Gln  
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Gln Glu Arg Ser Lys Pro Ser Phe His Ala Pro Glu Pro Lys Ala His  
 515 520 525

Tyr Glu Pro Ala Asp Arg Ala Arg Glu Val Pro Val Arg Thr Thr Ser  
 530 535 540

Arg Ser Pro Val Leu Ser Arg Arg Asp Ser Pro Leu Gln Gly Ser Gly  
 545 550 555 560

Gln Gln Asn Ser Gln Ala Gly Gln Arg Asn Ser Thr Ser Ser Ile Glu  
 565 570 575

Pro Arg Leu Leu Trp Glu Arg Val Glu Lys Leu Val Pro Arg Pro Gly  
 580 585 590

Ser Gly Ser Ser Ser Gly Ser Ser Asn Ser Gly Ser Gln Pro Gly Ser  
 595 600 605

His Pro Gly Ser Gln Ser Gly Ser Gly Glu Arg Phe Arg Val Arg Ser

610	615	620
Ser Ser Lys Ser Glu Gly Ser Pro Ser Gln Arg Leu Glu Asn Ala Val		
625	630	635 640
Lys Lys Pro Glu Asp Lys Lys Glu Val Phe Arg Pro Leu Lys Pro Ala		
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Gly Glu Val Asp Leu Thr Ala Leu Ala Lys Glu Leu Arg Ala Val Glu		
	660	665 670
Asp Val Arg Pro Pro His Lys Val Thr Asp Tyr Ser Ser Ser Ser Glu		
	675	680 685
Glu Ser Gly Thr Thr Asp Glu Glu Asp Asp Asp Val Glu Gln Glu Gly		
	690	695 700
Ala Asp Glu Ser Thr Ser Gly Pro Glu Asp Thr Arg Ala Ala Ser Ser		
705	710	715 720
Leu Asn Leu Ser Asn Gly Glu Thr Glu Ser Val Lys Thr Met Ile Val		
	725	730 735
His Asp Asp Val Glu Ser Glu Pro Ala Met Thr Pro Ser Lys Glu Gly		
	740	745 750
Thr Leu Ile Val Arg Gln Thr Gln Ser Ala Ser Ser Thr Leu Gln Lys		
	755	760 765
His Lys Ser Ser Ser Ser Phe Thr Pro Phe Ile Asp Pro Arg Leu Leu		
	770	775 780
Gln Ile Ser Pro Ser Ser Gly Thr Thr Val Thr Ser Val Val Gly Phe		
785	790	795 800
Ser Cys Asp Gly Met Arg Pro Glu Ala Ile Arg Gln Asp Pro Thr Arg		
	805	810 815
Lys Gly Ser Val Val Asn Val Asn Pro Thr Asn Thr Arg Pro Gln Ser		
	820	825 830
Asp Thr Pro Glu Ile Arg Lys Tyr Lys Lys Arg Phe Asn Ser Glu Ile		
	835	840 845
Leu Cys Ala Ala Leu Trp Gly Val Asn Leu Leu Val Gly Thr Glu Ser		
	850	855 860

Gly Leu Met Leu Leu Asp Arg Ser Gly Gln Gly Lys Val Tyr Pro Leu  
865 870 875 880

Ile Asn Arg Arg Arg Phe Gln Gln Met Asp Val Leu Glu Gly Leu Asn  
885 890 895

Val Leu Val Thr Ile Ser Gly Lys Lys Asp Lys Leu Arg Val Tyr Tyr  
900 905 910

Leu Ser Trp Leu Arg Asn Lys Ile Leu His Asn Asp Pro Glu Val Glu  
915 920 925

Lys Lys Gln Gly Trp Thr Thr Val Gly Asp Leu Glu Gly Cys Val His  
930 935 940

Tyr Lys Val Val Lys Tyr Glu Arg Ile Lys Phe Leu Val Ile Ala Leu  
945 950 955 960

Lys Ser Ser Val Glu Val Tyr Ala Trp Ala Pro Lys Pro Tyr His Lys  
965 970 975

Phe Met Ala Phe Lys Ser Phe Gly Glu Leu Val His Lys Pro Leu Leu  
980 985 990

Val Asp Leu Thr Val Glu Glu Gly Gln Arg Leu Lys Val Ile Tyr Gly  
995 1000 1005

Ser Cys Ala Gly Phe His Ala Val Asp Val Asp Ser Gly Ser Val  
1010 1015 1020

Tyr Asp Ile Tyr Leu Pro Thr His Val Arg Lys Asn Pro His Ser  
1025 1030 1035

Met Ile Gln Cys Ser Ile Lys Pro His Ala Ile Ile Ile Leu Pro  
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Asn Thr Asp Gly Met Glu Leu Leu Val Cys Tyr Glu Asp Glu Gly  
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Val Tyr Val Asn Thr Tyr Gly Arg Ile Thr Lys Asp Val Val Leu  
1070 1075 1080

Gln Trp Gly Glu Met Pro Thr Ser Val Ala Tyr Ile Arg Ser Asn  
1085 1090 1095

Gln Thr Met Gly Trp Gly Glu Lys Ala Ile Glu Ile Arg Ser Val

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 Glu Thr Gly His Leu Asp Gly Val Phe Met His Lys Arg Ala Gln  
 1115                      1120                      1125  
 Arg Leu Lys Phe Leu Cys Glu Arg Asn Asp Lys Val Phe Phe Ala  
 1130                      1135                      1140  
 Ser Val Arg Ser Gly Gly Ser Ser Gln Val Tyr Phe Met Thr Leu  
 1145                      1150                      1155  
 Gly Arg Thr Ser Leu Leu Ser Trp  
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 Asn Gly Thr Tyr Gly Gln Val Tyr Lys Gly Arg His Val Lys Thr Gly  
 35                      40                      45  
 Gln Leu Ala Ala Ile Lys Val Met Asp Val Thr Glu Asp Glu Glu Glu  
 50                      55                      60  
 Glu Ile Lys Gln Glu Ile Asn Met Leu Lys Lys Tyr Ser His His Arg  
 65                      70                      75                      80  
 Asn Ile Ala Thr Tyr Tyr Gly Ala Phe Ile Lys Lys Ser Pro Pro Gly  
 85                      90                      95  
 Asn Asp Asp Gln Leu Trp Leu Val Met Glu Phe Cys Gly Ala Gly Ser  
 100                      105                      110  
 Val Thr Asp Leu Val Lys Asn Thr Lys Gly Asn Ala Leu Lys Glu Asp  
 115                      120                      125  
 Cys Ile Ala Tyr Ile Cys Arg Glu Ile Leu Arg Gly Leu Ala His Leu  
 130                      135                      140



His Ala His Lys Val Ile His Arg Asp Ile Lys Gly Gln Asn Val Leu  
 145 150 155 160

Leu Thr Glu Asn Ala Glu Val Lys Leu Val Asp Phe Gly Val Ser Ala  
 165 170 175

Gln Leu Asp Arg Thr Val Gly Arg Arg Asn Thr Phe Ile Gly Thr Pro  
 180 185 190

Tyr Trp Met Ala Pro Glu Val Ile Ala Cys Asp Glu Asn Pro Asp Ala  
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Thr Tyr Asp Tyr Arg Ser Asp Ile Trp Ser Leu Gly Ile Thr Ala Ile  
 210 215 220

Glu Met Ala Glu Gly Ala Pro Pro Leu Cys Asp Met His Pro Met Arg  
 225 230 235 240

Ala Leu Phe Leu Ile Pro Arg Asn Pro Pro Pro Arg Leu Lys Ser Lys  
 245 250 255

Lys Trp Ser Lys Lys Phe Ile Asp Phe Ile Asp Thr Cys Leu Ile Lys  
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Thr Tyr Leu Ser Arg Pro Pro Thr Glu Gln Leu Leu Lys Phe Pro Phe  
 275 280 285

Ile Arg Asp Gln Pro Thr Glu Arg Gln Val Arg Ile Gln Leu Lys Asp  
 290 295 300

His Ile Asp Arg Ser Arg Lys Lys Arg Gly Glu Lys Glu Glu Thr Glu  
 305 310 315 320

Tyr Glu Tyr Ser Gly Ser Glu Glu Glu Asp Asp Ser His Gly Glu Glu  
 325 330 335

Gly Glu Pro Ser Ser Ile Met Asn Val Pro Gly Glu Ser Thr Leu Arg  
 340 345 350

Arg Glu Phe Leu Arg Leu Gln Gln Glu Asn Lys Ser Asn Ser Glu Ala  
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Leu Lys Gln Gln Gln Gln Leu Gln Gln Gln Gln Arg Asp Pro Glu  
 370 375 380

Ala His Ile Lys His Leu Leu His Gln Arg Gln Arg Arg Ile Glu Glu  
 385 390 395 400

Gln Lys Glu Glu Arg Arg Arg Val Glu Glu Gln Gln Arg Arg Glu Arg  
405 410 415

Glu Gln Arg Lys Leu Gln Glu Lys Glu Gln Gln Arg Arg Leu Glu Asp  
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Met Gln Ala Leu Arg Arg Glu Glu Glu Arg Arg Gln Ala Glu Arg Glu  
435 440 445

Gln Glu Tyr Lys Arg Lys Gln Leu Glu Glu Gln Arg Gln Ser Glu Arg  
450 455 460

Leu Gln Arg Gln Leu Gln Gln Glu His Ala Tyr Leu Lys Ser Leu Gln  
465 470 475 480

Gln Gln Gln Gln Gln Gln Gln Leu Gln Lys Gln Gln Gln Gln Gln Leu  
485 490 495

Leu Pro Gly Asp Arg Lys Pro Leu Tyr His Tyr Gly Arg Gly Met Asn  
500 505 510

Pro Ala Asp Lys Pro Ala Trp Ala Arg Glu Val Glu Glu Arg Thr Arg  
515 520 525

Met Asn Lys Gln Gln Asn Ser Pro Leu Ala Lys Ser Lys Pro Gly Ser  
530 535 540

Thr Gly Pro Glu Pro Pro Ile Pro Gln Ala Ser Pro Gly Pro Pro Gly  
545 550 555 560

Pro Leu Ser Gln Thr Pro Pro Met Gln Arg Pro Val Glu Pro Gln Glu  
565 570 575

Gly Pro His Lys Ser Leu Val Ala His Arg Val Pro Leu Lys Pro Tyr  
580 585 590

Ala Ala Pro Val Pro Arg Ser Gln Ser Leu Gln Asp Gln Pro Thr Arg  
595 600 605

Asn Leu Ala Ala Phe Pro Ala Ser His Asp Pro Asp Pro Ala Ile Pro  
610 615 620

Ala Pro Thr Ala Thr Pro Ser Ala Arg Gly Ala Val Ile Arg Gln Asn  
625 630 635 640

Ser Asp Pro Thr Ser Glu Gly Pro Gly Pro Ser Pro Asn Pro Pro Ala  
645 650 655

Trp Val Arg Pro Asp Asn Glu Ala Pro Pro Lys Val Pro Gln Arg Thr  
660 665 670

Ser Ser Ile Ala Thr Ala Leu Asn Thr Ser Gly Ala Gly Gly Ser Arg  
675 680 685

Pro Ala Gln Ala Val Arg Ala Ser Asn Pro Asp Leu Arg Arg Ser Asp  
690 695 700

Pro Gly Trp Glu Arg Ser Asp Ser Val Leu Pro Ala Ser His Gly His  
705 710 715 720

Leu Pro Gln Ala Gly Ser Leu Glu Arg Asn Arg Val Gly Val Ser Ser  
725 730 735

Lys Pro Asp Ser Ser Pro Val Leu Ser Pro Gly Asn Lys Ala Lys Pro  
740 745 750

Asp Asp His Arg Ser Arg Pro Gly Arg Pro Ala Asp Phe Val Leu Leu  
755 760 765

Lys Glu Arg Thr Leu Asp Glu Ala Pro Arg Pro Pro Lys Lys Ala Met  
770 775 780

Asp Tyr Ser Ser Ser Ser Glu Glu Val Glu Ser Ser Glu Asp Asp Glu  
785 790 795 800

Glu Glu Gly Glu Gly Gly Pro Ala Glu Gly Ser Arg Asp Thr Pro Gly  
805 810 815

Gly Arg Ser Asp Gly Asp Thr Asp Ser Val Ser Thr Met Val Val His  
820 825 830

Asp Val Glu Glu Ile Thr Gly Thr Gln Pro Pro Tyr Gly Gly Gly Thr  
835 840 845

Met Val Val Gln Arg Thr Pro Glu Glu Glu Arg Asn Leu Leu His Ala  
850 855 860

Asp Ser Asn Gly Tyr Thr Asn Leu Pro Asp Val Val Gln Pro Ser His  
865 870 875 880

Ser Pro Thr Glu Asn Ser Lys Gly Gln Ser Pro Pro Ser Lys Asp Gly  
885 890 895

Ser Gly Asp Tyr Gln Ser Arg Gly Leu Val Lys Ala Pro Gly Lys Ser  
 900 905 910

Ser Phe Thr Met Phe Val Asp Leu Gly Ile Tyr Gln Pro Gly Gly Ser  
 915 920 925

Gly Asp Ser Ile Pro Ile Thr Ala Leu Val Gly Gly Glu Gly Thr Arg  
 930 935 940

Leu Asp Gln Leu Gln Tyr Asp Val Arg Lys Gly Ser Val Val Asn Val  
 945 950 955 960

Asn Pro Thr Asn Thr Arg Ala His Ser Glu Thr Pro Glu Ile Arg Lys  
 965 970 975

Tyr Lys Lys Arg Phe Asn Ser Glu Ile Leu Cys Ala Ala Leu Trp Gly  
 980 985 990

Val Asn Leu Leu Val Gly Thr Glu Asn Gly Leu Met Leu Leu Asp Arg  
 995 1000 1005

Ser Gly Gln Gly Lys Val Tyr Gly Leu Ile Gly Arg Arg Arg Phe  
 1010 1015 1020

Gln Gln Met Asp Val Leu Glu Gly Leu Asn Leu Leu Ile Thr Ile  
 1025 1030 1035

Ser Gly Lys Arg Asn Lys Leu Arg Val Tyr Tyr Leu Ser Trp Leu  
 1040 1045 1050

Arg Asn Lys Ile Leu His Asn Asp Pro Glu Val Glu Lys Lys Gln  
 1055 1060 1065

Gly Trp Thr Thr Val Gly Asp Met Glu Gly Cys Gly His Tyr Arg  
 1070 1075 1080

Val Val Lys Tyr Glu Arg Ile Lys Phe Leu Val Ile Ala Leu Lys  
 1085 1090 1095

Ser Ser Val Glu Val Tyr Ala Trp Ala Pro Lys Pro Tyr His Lys  
 1100 1105 1110

Phe Met Ala Phe Lys Ser Phe Ala Asp Leu Pro His Arg Pro Leu  
 1115 1120 1125

Leu Val Asp Leu Thr Val Glu Glu Gly Gln Arg Leu Lys Val Ile  
1130 1135 1140

Tyr Gly Ser Ser Ala Gly Phe His Ala Val Asp Val Asp Ser Gly  
1145 1150 1155

Asn Ser Tyr Asp Ile Tyr Ile Pro Val His Ile Gln Ser Gln Ile  
1160 1165 1170

Thr Pro His Ala Ile Ile Phe Leu Pro Asn Thr Asp Gly Met Glu  
1175 1180 1185

Met Leu Leu Cys Tyr Glu Asp Glu Gly Val Tyr Val Asn Thr Tyr  
1190 1195 1200

Gly Arg Ile Ile Lys Asp Val Val Leu Gln Trp Gly Glu Met Pro  
1205 1210 1215

Thr Ser Val Ala Tyr Ile Cys Ser Asn Gln Ile Met Gly Trp Gly  
1220 1225 1230

Glu Lys Ala Ile Glu Ile Arg Ser Val Glu Thr Gly His Leu Asp  
1235 1240 1245

Gly Val Phe Met His Lys Arg Ala Gln Arg Leu Lys Phe Leu Cys  
1250 1255 1260

Glu Arg Asn Asp Lys Val Phe Phe Ala Ser Val Arg Ser Gly Gly  
1265 1270 1275

Ser Ser Gln Val Tyr Phe Met Thr Leu Asn Arg Asn Cys Ile Met  
1280 1285 1290

Asn Trp  
1295

<210> 39  
<211> 1582  
<212> PRT  
<213> Homo sapiens

<400> 39

Met Ala Gly Pro Gly Gly Trp Arg Asp Arg Glu Val Thr Asp Leu Gly  
1 5 10 15

His Leu Pro Asp Pro Thr Gly Ile Phe Ser Leu Asp Lys Thr Ile Gly  
20 25 30

Leu Gly Thr Tyr Gly Arg Ile Tyr Leu Gly Leu His Glu Lys Thr Gly  
 35 40 45

Ala Phe Thr Ala Val Lys Val Met Asn Ala Arg Lys Thr Pro Leu Pro  
 50 55 60

Glu Ile Gly Arg Arg Val Arg Val Asn Lys Tyr Gln Lys Ser Val Gly  
 65 70 75 80

Trp Arg Tyr Ser Asp Glu Glu Glu Asp Leu Arg Thr Glu Leu Asn Leu  
 85 90 95

Leu Arg Lys Tyr Ser Phe His Lys Asn Ile Val Ser Phe Tyr Gly Ala  
 100 105 110

Phe Phe Lys Leu Ser Pro Pro Gly Gln Arg His Gln Leu Trp Met Val  
 115 120 125

Met Glu Leu Cys Ala Ala Gly Ser Val Thr Asp Val Val Arg Met Thr  
 130 135 140

Ser Asn Gln Ser Leu Lys Glu Asp Trp Ile Ala Tyr Ile Cys Arg Glu  
 145 150 155 160

Ile Leu Gln Gly Leu Ala His Leu His Ala His Arg Val Ile His Arg  
 165 170 175

Asp Ile Lys Gly Gln Asn Val Leu Leu Thr His Asn Ala Glu Val Lys  
 180 185 190

Leu Val Asp Phe Gly Val Ser Ala Gln Val Ser Arg Thr Asn Gly Arg  
 195 200 205

Arg Asn Ser Phe Ile Gly Thr Pro Tyr Trp Met Ala Pro Glu Val Ile  
 210 215 220

Asp Cys Asp Glu Asp Pro Arg Arg Ser Tyr Asp Tyr Arg Ser Asp Val  
 225 230 235 240

Trp Ser Val Gly Ile Thr Ala Ile Glu Met Ala Glu Gly Ala Pro Pro  
 245 250 255

Leu Cys Asn Leu Gln Pro Leu Glu Ala Leu Phe Val Ile Leu Arg Glu  
 260 265 270

Ser Ala Pro Thr Val Lys Ser Ser Gly Trp Ser Arg Lys Phe His Asn

275	280	285
Phe Met Glu Lys Cys Thr Ile Lys Asn Phe Leu Phe Arg Pro Thr Ser 290	295	300
Ala Asn Met Leu Gln His Pro Phe Val Arg Asp Ile Lys Asn Glu Arg 305	310	315
His Val Val Glu Ser Leu Thr Arg His Leu Thr Gly Ile Ile Lys Lys 325	330	335
Arg Gln Lys Lys Gly Ile Pro Leu Ile Phe Glu Arg Glu Glu Ala Ile 340	345	350
Lys Glu Gln Tyr Thr Val Arg Arg Phe Arg Gly Pro Ser Cys Thr His 355	360	365
Glu Leu Leu Arg Leu Pro Thr Ser Ser Arg Cys Arg Pro Leu Arg Val 370	375	380
Leu His Gly Glu Pro Ser Gln Pro Arg Trp Leu Pro Asp Arg Glu Glu 385	390	395
Pro Gln Val Gln Ala Leu Gln Gln Leu Gln Gly Ala Ala Arg Val Phe 405	410	415
Met Pro Leu Gln Ala Leu Asp Ser Ala Pro Lys Pro Leu Lys Gly Gln 420	425	430
Ala Gln Ala Pro Gln Arg Leu Gln Gly Ala Ala Arg Val Phe Met Pro 435	440	445
Leu Gln Ala Gln Val Lys Ala Lys Ala Ser Lys Pro Leu Gln Met Gln 450	455	460
Ile Lys Ala Pro Pro Arg Leu Arg Arg Ala Ala Arg Val Leu Met Pro 465	470	475
Leu Gln Ala Gln Val Arg Ala Pro Arg Leu Leu Gln Val Gln Ser Gln 485	490	495
Val Ser Lys Lys Gln Gln Ala Gln Thr Gln Thr Ser Glu Pro Gln Asp 500	505	510
Leu Asp Gln Val Pro Glu Glu Phe Gln Gly Gln Asp Gln Val Pro Glu 515	520	525

Gln Gln Arg Gln Gly Gln Ala Pro Glu Gln Gln Gln Arg His Asn Gln  
 530 535 540

Val Pro Glu Gln Glu Leu Glu Gln Asn Gln Ala Pro Glu Gln Pro Glu  
 545 550 555 560

Val Gln Glu Gln Ala Ala Glu Pro Ala Gln Ala Glu Thr Glu Ala Glu  
 565 570 575

Glu Pro Glu Ser Leu Arg Val Asn Ala Gln Val Phe Leu Pro Leu Leu  
 580 585 590

Ser Gln Asp His His Val Leu Leu Pro Leu His Leu Asp Thr Gln Val  
 595 600 605

Leu Ile Pro Val Glu Gly Gln Thr Glu Gly Ser Pro Gln Ala Gln Ala  
 610 615 620

Trp Thr Leu Glu Pro Pro Gln Ala Ile Gly Ser Val Gln Ala Leu Ile  
 625 630 635 640

Glu Gly Leu Ser Arg Asp Leu Leu Arg Ala Pro Asn Ser Asn Asn Ser  
 645 650 655

Lys Pro Leu Gly Pro Leu Gln Thr Leu Met Glu Asn Leu Ser Ser Asn  
 660 665 670

Arg Phe Tyr Ser Gln Pro Glu Gln Ala Arg Glu Lys Lys Ser Lys Val  
 675 680 685

Ser Thr Leu Arg Gln Ala Leu Ala Lys Arg Leu Ser Pro Lys Arg Phe  
 690 695 700

Arg Ala Lys Ser Ser Trp Arg Pro Glu Lys Leu Glu Leu Ser Asp Leu  
 705 710 715 720

Glu Ala Arg Arg Gln Arg Arg Gln Arg Arg Trp Glu Asp Ile Phe Asn  
 725 730 735

Gln His Glu Glu Glu Leu Arg Gln Val Asp Lys Asp Lys Glu Asp Glu  
 740 745 750

Ser Ser Asp Asn Asp Glu Val Phe His Ser Ile Gln Ala Glu Val Gln  
 755 760 765

Ile Glu Pro Leu Lys Pro Tyr Ile Ser Asn Pro Lys Lys Ile Glu Val



[illegible]

Ala Asn Arg Ser His Gly Gly Ser Ala Ala Ser Glu Asp Asn Ala  
 1025 1030 1035

Ala Ile Gly Asp Gln Glu Glu His Ala Ala Asn Ile Gly Ser Glu  
 1040 1045 1050

Arg Arg Gly Ser Glu Gly Asp Gly Gly Lys Gly Val Val Arg Thr  
 1055 1060 1065

Ser Glu Glu Ser Gly Ala Leu Gly Leu Asn Gly Glu Glu Asn Cys  
 1070 1075 1080

Ser Glu Thr Asp Gly Pro Gly Leu Lys Arg Pro Ala Ser Gln Asp  
 1085 1090 1095

Phe Glu Tyr Leu Gln Glu Glu Pro Gly Gly Gly Asn Glu Ala Ser  
 1100 1105 1110

Asn Ala Ile Asp Ser Gly Ala Ala Pro Ser Ala Pro Asp His Glu  
 1115 1120 1125

Ser Asp Asn Lys Asp Ile Ser Glu Ser Ser Thr Gln Ser Asp Phe  
 1130 1135 1140

Ser Ala Asn His Ser Ser Pro Ser Lys Gly Ser Gly Met Ser Ala  
 1145 1150 1155

Asp Ala Asn Phe Ala Ser Ala Ile Leu Tyr Ala Gly Phe Val Glu  
 1160 1165 1170

Val Pro Glu Glu Ser Pro Lys Gln Pro Ser Glu Val Asn Val Asn  
 1175 1180 1185

Pro Leu Tyr Val Ser Pro Ala Cys Lys Lys Pro Leu Ile His Met  
 1190 1195 1200

Tyr Glu Lys Glu Phe Thr Ser Glu Ile Cys Cys Gly Ser Leu Trp  
 1205 1210 1215

Gly Val Asn Leu Leu Leu Gly Thr Arg Ser Asn Leu Tyr Leu Met  
 1220 1225 1230

Asp Arg Ser Gly Lys Ala Asp Ile Thr Lys Leu Ile Arg Arg Arg  
 1235 1240 1245

Pro Phe Arg Gln Ile Gln Val Leu Glu Pro Leu Asn Leu Leu Ile

1250	1255	1260
Thr Ile Ser Gly His Lys Asn Arg Leu Arg Val Tyr His Leu Thr		
1265	1270	1275
Trp Leu Arg Asn Lys Ile Leu Asn Asn Asp Pro Glu Ser Lys Arg		
1280	1285	1290
Arg Gln Glu Glu Met Leu Lys Thr Glu Glu Ala Cys Lys Ala Ile		
1295	1300	1305
Asp Lys Leu Thr Gly Cys Glu His Phe Ser Val Leu Gln His Glu		
1310	1315	1320
Glu Thr Thr Tyr Ile Ala Ile Ala Leu Lys Ser Ser Ile His Leu		
1325	1330	1335
Tyr Ala Trp Ala Pro Lys Ser Phe Asp Glu Ser Thr Ala Ile Lys		
1340	1345	1350
Val Cys Ile Asp Gln Ser Ala Asp Ser Glu Gly Asp Tyr Met Ser		
1355	1360	1365
Tyr Gln Ala Tyr Ile Arg Ile Leu Ala Lys Ile Gln Ala Ala Asp		
1370	1375	1380
Pro Val Asn Arg Phe Lys Arg Pro Asp Glu Leu Leu His Leu Leu		
1385	1390	1395
Lys Leu Lys Val Phe Pro Thr Leu Asp His Lys Pro Val Thr Val		
1400	1405	1410
Asp Leu Ala Ile Gly Ser Glu Lys Arg Leu Lys Ile Phe Phe Ser		
1415	1420	1425
Ser Ala Asp Gly Tyr His Leu Ile Asp Ala Glu Ser Glu Val Met		
1430	1435	1440
Ser Asp Val Thr Leu Pro Lys Asn Pro Leu Glu Ile Ile Ile Pro		
1445	1450	1455
Gln Asn Ile Ile Ile Leu Pro Asp Cys Leu Gly Ile Gly Met Met		
1460	1465	1470
Leu Thr Phe Asn Ala Glu Ala Leu Ser Val Glu Ala Asn Glu Gln		
1475	1480	1485

Leu Phe Lys Lys Ile Leu Glu Met Trp Lys Asp Ile Pro Ser Ser  
 1490 1495 1500

Ile Ala Phe Glu Cys Thr Gln Arg Thr Thr Gly Trp Gly Gln Lys  
 1505 1510 1515

Ala Ile Glu Val Arg Ser Leu Gln Ser Arg Val Leu Glu Ser Glu  
 1520 1525 1530

Leu Lys Arg Arg Ser Ile Lys Lys Leu Arg Phe Leu Cys Thr Arg  
 1535 1540 1545

Gly Asp Lys Leu Phe Phe Thr Ser Thr Leu Arg Asn His His Ser  
 1550 1555 1560

Arg Val Tyr Phe Met Thr Leu Gly Lys Leu Glu Glu Leu Gln Ser  
 1565 1570 1575

Asn Tyr Asp Val  
 1580

<210> 40  
 <211> 140  
 <212> PRT  
 <213> Homo sapiens

<400> 40

Met Ser Asp Val Thr Leu Pro Lys Asn Pro Leu Glu Ile Ile Ile Pro  
 1 5 10 15

Gln Asn Ile Ile Ile Leu Pro Asp Cys Leu Gly Ile Gly Met Met Leu  
 20 25 30

Thr Phe Asn Ala Glu Ala Leu Ser Val Glu Ala Asn Glu Gln Leu Phe  
 35 40 45

Lys Lys Ile Leu Glu Met Trp Lys Asp Ile Pro Ser Ser Ile Ala Phe  
 50 55 60

Glu Cys Thr Gln Arg Thr Thr Gly Trp Gly Gln Lys Ala Ile Glu Val  
 65 70 75 80

Arg Ser Leu Gln Ser Arg Val Leu Glu Ser Glu Leu Lys Arg Arg Ser  
 85 90 95

Ile Lys Lys Leu Arg Phe Leu Cys Thr Arg Gly Asp Lys Leu Phe Phe  
 100 105 110

Thr Ser Thr Leu Arg Asn His His Ser Arg Val Tyr Phe Met Thr Leu  
115 120 125

Gly Lys Leu Glu Glu Leu Gln Ser Asn Tyr Asp Val  
130 135 140